

Research summary:

Effect of feeding inositol or high phytase on laying hen performance and amino acid digestibility



About the study

The addition of phytase to broiler and laying hen diets has become routine to minimize the adverse effects of phytic acid, with positive effects on poultry performance and broiler amino acid digestibility. With the use of levels of 1500 FTU and above, a near-complete de-phosphorylation phytate occurs, releasing inositol in the digestive tract. Inositol is a key element of multiple metabolic processes, and in broilers has

been shown that it might be contributing to the positive effects of phytase supplementation.

Little is known about its effect on laying hens. Thus, the goal of this project was to determine the impact of high levels of phytase or inositol on laying hen performance and amino acid digestibility.

How we did it

672 Lohmann LSL-Lite hens were assigned

to 1 of 5 ad libitum dietary treatments that offered a combination of high (840 mg Dlys/h/d) or reduced balanced protein (672 mg Dlys/h/d) and phytase, inositol or no supplementation. Data collection included performance (egg production and quality, feed efficiency) and amino acid digestibility.

What we found

No effects of diet on egg production (89.8%) or the percentage of unsaleable eggs (0.47%) were found.

Feeding inositol increased daily feed intake from 117.3 to 118.0 g/hen, but did not affect feed efficiency as no effect of diet was observed (2.15 g feed/g egg).

Diet did not affect egg weight (60.9 g) or the percentage of double (0.37%), soft (0.07%), cracked (0.21%) or broken eggs (0.09%). However, inositol increased the incidence of abnormally shaped eggs by 0.17%, which could have been associated with the reduced vent feather cover and number of cannibalism events. Additionally, inositol produced lower shell quality eggs.

Finally, amino acid digestibility was reduced in hens fed the reduced protein diet due to a reduction in the proportion of soybean meal in the diets. In addition, methionine digestibility was reduced when phytase was fed, but this was the only amino acid affected.

In conclusion

No benefit of feeding phytase or inositol on hen production performance or amino acid digestibility was found when hens were fed diets formulated with a sufficient level of nutrients.

However, an adverse effect of inositol on egg quality was found, which suggests a negative impact of feeding pure inositol to laying hens.

Who we are



Dr. Eugenia Herwig is a Post-Doctoral Fellow working with Dr. Karen Schwean-Lardner.



Dr. Karen Schwean-Lardner is an Associate Professor at the University of Saskatchewan. Her research focuses primarily on the management and welfare of laying hens, broiler chickens, and turkeys.



Dr. Hank Classen is a Distinguished Professor Emeritus at the University of Saskatchewan. His research focused on poultry nutrition and management.

This project was funded by: